

WHAT IS CLAIMED IS:

1. A method for preserving an oxygen infusion comprising an aqueous suspension of molecular assemblies which contain hemoglobin or a heme compound, said method comprising the steps of:

5           a) modifying the molecular assemblies with polyoxyethylene; and  
          b) converting the hemoglobin or the heme compound into a deoxy-form by removing oxygen from the suspension.

2. The method of Claim 1, wherein the molecular assemblies are selected from the group consisting of cell membranes, hemoglobin vesicle, lipid heme vesicle, lipid heme - triglyceride microsphere and albumin -lipid heme.

3. The method of Claim 1, wherein the removal of oxygen is performed by gas exchange with an inert gas.

4. The method of Claim 1, further comprising:  
storing said suspension in an oxygen-impermeable container filled with an inert gas.

5. The method of Claim 1, wherein the suspension contains a physiologically acceptable reducing agent.

6. The method of Claim 1, wherein the heme compound comprises a porphyrin ring having a substituent, said compound having reversible oxygen-binding potential.

7. The method of Claim 1, wherein the molecular assemblies are modified by fixing  
20 the polyoxyethylene onto surfaces thereof.

8. The method of Claim 7, wherein said polyoxyethylene has a molecular weight of about 1,000 to 20,000.

9. The method of Claim 7, wherein said polyoxyethylene is present in an amount of

about 0.01 to 3 mol% with respect to a total amount of lipid exposed on an outer surface of each particle of the molecular assemblies.

10. The method of Claim 7, wherein said polyoxyethylene is fixed into the surface of the molecular assemblies by a hydrophobic moiety of the polyoxyethylene.

5 11. The method of Claim 10, wherein the hydrophobic moiety comprises ethanolamine phospholipid, cholesterol, alkyl-chain-linked glutamic acid or alkyl-chain-linked lysine.

12. The method of Claim 11, wherein the polyoxyethylene is N-(monomethoxypolyoxyethylene carbamyl)distearoyl phosphatidyl-ethanolamine.

13. The method of Claim 1, wherein said oxygen infusion exhibits no loss of oxygen transport function after storage at 40°C for six months.

14. The method of Claim 1, which further comprises after step b), storing said oxygen infusion under nitrogen.

15. The method of Claim 14, wherein said oxygen infusion exhibits no loss of oxygen transport function after storage at 23°C under nitrogen for one year.

16. A method of producing an oxygen infusion comprising an aqueous suspension of molecular assemblies which contain hemoglobin or a heme compound, said method comprising the steps of:

- 20 a) preparing a suspension of the molecular assembly containing the hemoglobin or the heme compound, the molecular assembly being modified with polyoxyethylene;
- b) making the hemoglobin or the heme compound into a deoxy-form by removing oxygen from the suspension; and
- c) packing the suspension containing the deoxy-form hemoglobin or heme compound, in an oxygen-impermeable container which is filled with an inert gas.

17. An oxygen infusion, comprising a suspension of molecular assemblies comprising hemoglobin or a heme compound, the assemblies being modified with polyoxyethylene; said hemoglobin or heme compound being in a deoxy-form.

18. The oxygen infusion of Claim 17, wherein said molecular assemblies are modified by having said polyoxyethylene fixed onto surfaces thereof.

19. The oxygen infusion of Claim 17, wherein said polyoxyethylene has a molecular weight of about 1,000 to 20,000.

20. The oxygen infusion of Claim 18, wherein said polyoxyethylene is present in an amount of about 0.01 to 3 mol% with respect to a total amount of lipid exposed on an outer surface of each particle of the molecular assemblies.

21. The oxygen infusion of Claim 17, wherein the molecular assemblies are cell membranes.

22. The oxygen infusion of Claim 17, wherein the molecular assemblies are hemoglobin vesicles.

23. The oxygen infusion of Claim 17, wherein the molecular assemblies are lipid heme vesicles.

24. The oxygen infusion of Claim 17, wherein the molecular assemblies are lipid heme-triglyceride microspheres.

25. The oxygen infusion of Claim 17, wherein the molecular assemblies are albumin-lipid heme.

26. The oxygen infusion of Claim 17, which is stored in a container.

27. The oxygen infusion of Claim 26, wherein the container is a bottle.

28. The oxygen infusion of Claim 26, which is stored under an inert gas atmosphere.